PROVIDER PROMPTING TO IMPROVE COLORECTAL CANCER SCREENING RATES

by

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Abstract

Colorectal cancer (CRC) screening is recommended for average risk adults aged 50 to 75 years. Healthy People 2020 objectives include reducing new cancer cases and the illness, disability, and deaths secondary to cancer. Effective CRC screening may prevent cancer through detection and removal of precancerous growths, and may detect cancer in early stages where treatment can lead to a cure. CRC screening rates at an Eastern North Carolina Federally Qualified Health Center (FQHC) were unacceptably low. This Doctor of Nursing Practice (DNP) project implements provider prompting, including an electronic medical record (EMR) reminder and the use of a daily patient list, to help improve provider compliance with offering CRC screening and to improve CRC screening rates. An EMR data mining issue was discovered during implementation, raising baseline CRC completed screening rates from 43.6% to 49.3%. After an eight-week project implementation period, completed CRC screenings increased from 49.3% at baseline to 56.8%. Simple, cost-effective interventions led to a significant increase in completed screenings. The organization will need to further evaluate if other documentation errors could be artificially driving down other key performance values.

Key words: Colorectal cancer screening; provider prompting; electronic medical record reminders; daily patient lists

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Chapter One: Improving Colorectal Cancer Screening Rates

Colorectal cancer is the fourth most commonly diagnosed cancer and is ranked second in cancer deaths among adults United States (CDC, 2018b). The American Cancer Society (ACS) (2018a) estimates there will be 4,440 new cases of colorectal cancer and 1,570 deaths in North Carolina in 2018.

The U.S. Preventative Services Task Force (USPSTF) recommends screening average risk adults for colorectal cancer from age 50 years until age 75 years. *Average risk* refers to asymptomatic adults who (1) do not have a family history of known genetic disorders linked to colorectal cancer, (2) a personal history of inflammatory bowel disease, (3) a previous adenomatous polyp, or (4) previous colorectal cancer (USPSTF, 2017). Recommended screening options include (1) colonoscopy every 10 years, (2) annual FIT (fecal immunochemical test), (3) annual high-sensitivity FOBT (fecal occult blood test), or (4) flexible sigmoidoscopy every 5 years combined with high-sensitivity FOBT every 3 years (ACS, 2017; CDC, 2018a; USPSTF, 2017). No screening method is considered more effective than another, although there are differing costs, benefits, and potential risks to consider when choosing a screening method (ACS, 2017; USPSTF, 2017). Instead of ranking specific screenings' effectiveness, current recommendations advise that offering several options could increase patient participation in colorectal cancer screening. Specifically, colorectal cancer screening rates increase when patients can choose between several screening methods (ACS, 2017; ACS, 2018b; USPSTF, 2017). According to the American Cancer Society (2018b), "the best CRC screening test is the one that gets done and done well" (p. 275-276). Thus, the most important element of colorectal cancer screening is that it is performed, regardless of method. Despite

availability of screening options, one-third of eligible adults in the United States have never been screened for colorectal cancer (National Center for Health Statistics, 2016).

Some populations have lower screening rates than others. Populations with low rates of colorectal cancer screening include the medically underserved such as racial or ethnic minorities, immigrants, and groups with low socioeconomic status (Gwede et al., 2015). Best, Strane, Christie, Bynum, & Wiltshire (2017) wrote that low socioeconomic status is associated with low literacy levels, limited or no health insurance, and reduced access to preventive care and treatment services. Unfortunately, the two groups with the lowest CRC screening rates are the uninsured and immigrants with fewer than 10 years residence in the U.S. (National Center for Health Statistics, 2016).

Federally Qualified Health Centers (FQHC) offer sliding-fee income-based services for the medically underserved populations i.e., uninsured, immigrant, and homeless populations. FQHC patients are at greater risk for developing cancer and experiencing worse cancer outcomes than the general U.S. population (Roland et al., 2017). Lack of insurance, cost concerns, transportation issues, and language barriers impede care for these populations (ACS, 2017). These issues impact screening rates which contribute to poor outcomes. Increasing colorectal cancer screenings in FQHC settings address cancer disparities among these populations. The purpose of this chapter is to detail a Quality Improvement project which aimed to increase colorectal cancer screening at an Eastern North Carolina FQHC.

Background Information

Healthy People 2020 objectives include reducing (1) new cancer cases, (2) illness, (3) disability, and (4) deaths secondary to cancer burden (Office of Disease Prevention and Health Promotion, 2018). Healthy People 2020 cancer objectives also support monitoring trends in

cancer incidence, mortality, and survival to assess progress toward decreasing the U.S. cancer burden. Healthy People 2020 goals include a 10% to 15% reduction in death rates from 2007 to 2020 for selected cancers, and invasive colon cancer incidence rates are monitored as a marker of cancer screening success (Office of Disease Prevention and Health Promotion, 2018).

The Center for Disease Control's Colorectal Cancer Control Program (CRCCP) set a goal for 80% screening of age-eligible adults (CDC, 2017). The National Colorectal Cancer Roundtable, established by the ACS also set a goal of regular screening for colorectal cancer for 80% of all adults in the United States. Many other organizations have committed to work towards this goal (ACS, 2018c).

Significance of Clinical Problem

Effective colorectal cancer screening may prevent cancer through detection and removal of precancerous growths, and detect cancer in early stages (ACS, 2018b). Colorectal cancer treatment in its earliest stage can lead to a 90 percent survival rate after five years (ACS, 2017. Between 2010 and 2014, age-adjusted incidence rates of colon and rectum cancer in North Carolina was 37.7 per 100,000 persons per year (North Carolina State Center for Health Statistics, 2017). This statistic corresponds to national age-adjusted incidence rates of 38 per 100,000 in 2015 (CDC, 2018b).

CRC death rates have been decreasing since 1980 in men and since 1947 in women. These decreases are attributed to increased screening, treatment improvements, and changing patterns in CRC risk factors such as sedentary lifestyle, Western diet, and smoking (ACS, 2017). However, CRC financial care cost nationwide has increased due to (1) higher costs for cancer survivors and (2) more advanced treatments become standards of care (NCI, 2018). Nationwide, colorectal cancer care cost in 2017 was 16.3 billion compared to 14.1 billion in 2010 (NCI,

2018). Cancer care burden can be financially devastating for patients. A recent longitudinal study evaluating the impact of cancer upon a patient's net worth and debt in the United States evaluated 9.5 million newly diagnosed persons with cancer greater than 50 years of age. The study found that financial insolvency extended to 38.2% at 4 years after cancer diagnosis (Gilligan, Alberts, Roe, & Skrepnek, 2018). Early detection will decrease cancer's financial impact because late detection results in much higher treatment costs. New biologic therapies in the most advanced stage IV disease led to significant treatment cost (Ananda et al., 2016). Metastatic CRC treatments cost more because surgery, chemotherapy, immunotherapy, and biologic treatments may be necessary (Zadlo, 2018).

Colorectal cancer screening rates at FQHCs indicate a one percent screening increase yearly from 2015-2017 (Health Resources and Services Administration, 2017). In 2017, the percentage of patients 50 through 75 years of age who had appropriate screening for colorectal cancer at FQHCs nationwide was 42.02% (Health Resources and Services Administration, 2017). Unfortunately, this is below the 80% goal set by the National Colorectal Cancer Roundtable (ACS, 2018c).

An Eastern NC FQHC had a colorectal screening rate goal of 60% per the FQHC's Director of Quality Improvement. As of August 2018 only 33% of the FQHC's eligible patients had EMR documentation of CRC screening having been performed for the previous year (L. Avery, personal communication, August 27, 2018). Current screening rates were significantly below the FQHC's 60% screening rate goal (L. Avery, personal communication, August 27 2018). Clinic screening rates also did not meet the current national FQHC screening rate of 42.02% (Health Resources and Services Administration, 2017).

Question Guiding Inquiry (PICO)

Population. The site's Primary Care Providers (PCPs) of medical services include Physicians (both MD and DO), Nurse Practitioners, and Physician's Assistants. Provider years of experience as PCPs vary from <2 years of practice to > 40 years of practice. Physicians are board certified in Family Medicine, Internal Medicine, or Obstetrics/Gynecology. Nurse Practitioners are certified as Family Nurse Practitioners, Adult-Geriatric Nurse Practitioners or Acute Care Nurse Practitioners (M. Smith, personal communication, September 4, 2018).

Intervention. The proposed intervention for the DNP project was to increase provider delivery of colorectal screening options by using provider prompts, specifically through Electronic Medical Record (EMR) reminders and daily lists of patients who do not have current CRC screening documented in the EMR. The Medical Assistant were to print a daily list of patients who are not current on CRC screening. When providers open a patient's chart, a pop-up notification alerts the provider that the patient needs colon cancer screening. Once alerted, the FQHC providers offered one of three screening options for colorectal screening for average risk adults age 50-75: (1) FOBT yearly, (2) flexible sigmoidoscopy every five years, or (3) colonoscopy every 10 years. Once screening was selected through mutual provider-patient discussion and discussion of individual costs, benefits, and risks, the FQHC provider were to document the screening in the appropriate location in the EMR.

Comparison. There was not currently a standardized format for colorectal cancer screening at the Eastern NC FQHC. It is possible that providers are performing colorectal screening at a rate higher than the current data reflects; this could be due to incorrect or inconsistent documentation and/or incorrect data retrieval in the EMR.

Outcome. The goal outcome of the proposed DNP project was to improve provider compliance with offering colorectal cancer screenings and improved colorectal cancer screening rates. Per the Director of Quality Improvement at an Eastern NC FQHC, the FQHC's goal is 60% goal; this goal was set after an evaluation of the Healthy People 2020 goals, state and national Community Health Center performance for the previous year, and the FQHC's past performance (L. Avery, personal communication, September 6, 2018). However, for the purpose of this DNP project the goal was compliance with the practice change (EMR alert, use of the daily patient list, and improved documentation) and improvement with colorectal cancer screening rates overall.

Summary

Although multiple screening options are available, colorectal cancer screening rates were unacceptably low at an Eastern NC FQHC. Evidence needed evaluation to solve the problem. The purpose of the DNP project was to (1) create daily lists of patients without current CRC screening documented in the EMR and (2) adding a pop-up EMR alert to providers that colorectal screenings were due. By using daily patient lists and EMR alerts to providers, it was hoped that colorectal cancer screening rates at the Eastern NC FQHC would improve. Improvement in colorectal cancer screenings would benefit FQHC patients who are at greater risk for developing cancer with worse outcomes compared to the general U.S. population (Roland et al., 2017).

Chapter Two: Review of the Literature

The purpose of this literature review is to understand the evidence in the literature as it pertains to electronic medical record and provider-based strategies to increase colorectal cancer screening uptake.

Methodology

Sampling strategies. A literature search was conducted using PubMed for information related to colorectal cancer screening, electronic medical record reminders, and other possible provider-related interventions. The specific search terms utilized were ((*colorectal cancer screening* OR *colon cancer screening*)) AND ((*electronic health record* OR *electronic medical record* AND *alert* OR *reminder*)). The results were filtered to include only those results published within the last 5 years. After filtering down to the most recent literature, 98 results remained.

Evaluation criteria. After reviewing the titles of the 98 available results, exclusions were necessary to limit the results only to information that pertained to provider-based interventions or strategies. Exclusions included those articles detailing client-focused interventions such as web-based, mailed, telephone, or text reminders to patients, client-focused studies, provider-focused interventions such as involving financial incentives or receiving reminder letters, patient navigation interventions, or articles unrelated to CRC screening. After these exclusions, 53 results remained for consideration. A review of abstracts was necessary to further refine articles for inclusion, using the same exclusion criteria. After the review of abstracts, 20 articles remained. The 20 articles were read in their entirety, and further exclusions were necessary. The final round of exclusions included articles which were unrelated to provider-based interventions or strategies and 12 articles were kept for inclusion.

Additional search. Upon completion of the search and review of the original 12 articles, it became clear that further research was necessary regarding the intervention of provider recommendation. A search was performed using PubMed for additional information with the search (*provider recommendation* AND *colorectal cancer screening*) and results were limited to those published within the last 5 years. 30 articles were found; 11 articles were excluded after completion of the review of titles. Articles excluded included those concerning CRC screening in at-risk populations, relatives of CRC patients, or other special populations. Additional exclusions were those articles unrelated to CRC screening or provider recommendation of screening.

A review of abstracts was then performed on the remaining 19 articles. Further exclusions including those articles detailing surveys of patient knowledge of or attitudes related to CRC screening, surveys of non-adherent populations, mailed provider recommendations, plans for future studies, telephone surveys, or those unrelated to provider recommendation. The remaining 8 articles were read in their entirety and all were kept for inclusion.

Upon review of included articles' reference lists, a further 9 articles within the last 5 years were located by title, reviewed by abstract, read in their entirety, and included.

Literature Review Findings

The Community Preventative Services Task Force (CPSTF) (2013) recommends the use of multicomponent evidence-based strategies to increase the use of CRC screening tests. These strategies include client and provider reminders, the reduction of structural barriers limiting access to screening services, the use of high quality small media, provider reminder and recall systems, and provider assessment and feedback (CPSTF, 2013). Although multicomponent strategies are recommended, the proposed DNP project focused on those strategies solely

affecting providers due to budgetary constraints and the limited project timeframe. After a review of the literature, several elements related to provider-specific interventions became clear.

Provider Reminders. The review of the literature indicated that provider prompting increased rates of preventative screenings and vaccinations. Zimet et al. (2017) and Gutierrez, Bracamontes, Molokwi, Villanos, & Mendez (2017) found increased HPV vaccine rates with implementation of provider prompting. Zimet et al. (2017) conducted a randomized clinical trial involving 29 pediatric health providers in 5 clinics. In this trial, a provider prompt for human papillomavirus (HPV) vaccine resulted in higher first dose administration of the vaccine. Gutierrez, Bracamontes, Molokwu, Villanos, & Mendez (2017) found that an electronic medical record prompt improved HPV vaccination rates overall after a retrospective chart review of 2800 patient charts in an academic clinic setting. Onders, Spillane, Reilley, & Leston (2014) showed after reviewing four years of screening rates that use of electronic clinical reminders increased completion of five types of preventive screenings in Indian Health Service clinics in Alaska. Siembida, Radhakrishnan, Nowak, Parker, & Pollack (2017) distributed a national physician survey and found that receiving EMR reminders significantly increased the likelihood of physicians recommending mammography screening; however, this data is questionable as this survey was based on physician opinions and not backed up by screening rate data.

Provider prompting increased colorectal cancer screening rates when utilized in multi-component interventions in three distinct studies, each involving multiple clinical sites (Adams, et al., 2018; Feldman, Davie, & Kiran, 2017; Mader et al., 2016). A randomized multi site clinical trial implemented a multicomponent intervention including: provider-focused reminder and recall, provider assessment and feedback, and a personalized reminder letter to overdue patients initiated by the provider (Feldman, Davie, & Kiran, 2017). In addition, interventions

included updating charts with accurate data on the FOBT and improving the EMR reminder function. The authors noted an increase in colorectal cancer screening rates by 11% (Feldman, Davie, & Kiran, 2017). Mader et al. (2016) implemented a variety of quality improvement interventions including electronic health record data cleaning workflows, provider audits and feedback, reminder systems streamlining, and patient education and outreach interventions in twenty-three practices and CRC screening improved by 5.6% over six months. A cross sectional survey of FQHCs in eight studies by Adams et al. (2018) showed higher CRC screening rates associated with provider prompting in a multi-level approach. In this study, the approach included both provider and client reminders, reducing structural barriers, and provider assessment and feedback. However, the authors did not provide specifics in regards to percentage of improvement after implementation.

Provider reminders improved CRC screening although multifactor interventions were more effective in two systematic reviews. Senore, Inadomi, Segnan, Bellisario, & Hassan, C. (2015) found through a systematic review of 17 randomized controlled trials that provider involvement was highly effective in improving compliance with CRC screening with a higher impact for tests that can be directly administered by the provider. Multifactor interventions targeting multiple levels of care and considering factors outside the provider's control were found to be more effective; however, statistics noting the specific range of increase were not noted for either point (Senore et al., 2015). Dougherty et al., (2018) demonstrated a more quantifiable benefit in a systematic review and meta-analysis of 18 randomized controlled trials; a 13% screening increase overall was found with all visit-based interventions consisting of a reminder to the clinician via paper or EMR.

EMR Reminder. Two recent large-scale studies specifically demonstrated that the use of electronic medical record reminders improved CRC screening rates (Guiriguet et al., 2016; Kim et al, 2018). Kim et al. (2018) sought to identify patient, provider, and delivery system-level factors associated with CRC screening across eight primary care clinics involving 16,606 patients and 54 providers in Nebraska. In a mixed-methods study including analysis of the electronic health record, provider survey, and provider interview, the electronic medical system reminder was found to positively correlate with CRC screening and was the only delivery system factor found clinically significant.

Guiriguet et al. (2016) found through a randomized controlled trial of 130 physicians with 41,042 patients that the use of an alert in an individual's primary care EMR was associated with a statistically significant increased uptake of an organized FIT-based CRC screening program. Of note, the EMR alert was not associated with a statistically significant increased participation in the first round of the screening program; however, when the analysis was restricted to those individuals at the scheduled program follow-up period, there was up to an 11% increase in CRC screening participation.

Patient List. Two studies showed improvement in CRC screening with interventions including the use of a patient list (Baxter et al. 2017; Joseph, Redwood, DeGroff & Butler, 2016). Baxter et al. (2017) found in a population-based survey that while PCPs had adopted provider-based strategies to enhance CRC screening participation including electronic medical record use, reminders, generation of lists, audit and feedback reports, or designating staff members responsible for screening, only the use of patient list generation was individually associated with statistically significant screening uptake. However, the use of multiple provider strategies to enhance CRC screening uptake was associated with patient screening participation

(Baxter et al., 2017). Joseph, Redwood, DeGroff & Butler (2016) utilized patient and provider reminders including daily patient lists, along with patient navigation in two regional health programs in Alaska and Washington; increases in CRC screening increased statewide 8.5% and 24% respectively over a period of three years; however, the percentage increase was not delineated per specific intervention.

Provider Recommendation. Provider recommendation was positively correlated with breast, cervical, and colorectal cancer screening in two systematic reviews examining randomized controlled trials with noted improvement in screening (Duffy, Myles, Maroni, & Mohammad, 2017; Peterson et al., 2016). However, one review specifically detailed provider-patient communication interventions (Peterson et al., 2016) and the other had a broader scope with multiple interventions to improve participation in cancer screening services (Duffy et al., 2017). Peterson et al. (2016) examined 24 studies and found that provider recommendation significantly improves cancer screening rates across a variety of populations including urban and rural, different geographic regions, and various ethnicities. In this review, 14 of those studies were specific to colorectal cancer screening. Duffy et al. (2017) reviewed 61 randomized controlled trials with 12 studies specific to provider endorsement. This review included 6 studies which dealt with colorectal cancer specifically but all showed increases in screening participation with provider endorsement. Of note, 4 studies specifically reported the effect in underserved populations and noted an increase with the primary care recommendation intervention although only one of those was specific to colorectal cancer (Duffy et al., 2017).

Two surveys indicated that provider recommendation or endorsement is an important element of the patient's decision to participate in cancer screening (Cooper & Gelb, 2016; Laiyemo et al., 2014). Discussion about screening and providers making a specific

recommendation about screening modality rather than leaving it to the patient to decide were associated with patient compliance with CRC screening uptake in an analysis of 4,283 respondents in the 2007 Health Information National Trends Survey data (Laiyemo et al., 2014). A lack of screening awareness/provider recommendations was included in the reasons given for screening non-participation in 16 focus groups nationwide in research performed by the Centers for Disease Control and Prevention's Screen for Life: National Colorectal Cancer Action Campaign (Cooper & Gelb, 2016).

Three cross-sectional studies and one descriptive study indicated that provider recommendation is significant for screening participation in underserved or minority groups. Three of the studies specifically involved underserved or minority groups in low income areas (Davis, Morris, Rademaker, Ferguson, & Arnold, 2017; May, Almario, Ponce, & Spiegel, 2015; Savas, Vernon, Atkinson, & Fernández, 2015) while one study looked at a large and diverse population with a range of income (Nagelhout, Comarell, Samadder, & Wu, 2017). All four studies reflect the significance of provider recommendation for screening.

Physician's recommendation for screening in low-income Latino men and women increased screening odds nearly five-fold (Savas et al., 2015), while Nagelhout et al. (2017) found lack of provider communication about CRC screening in a racially diverse safety-net potentially contributed to low screening rates among minority populations. Potential missed opportunities for screening were demonstrated in two of the studies. May et al. (2015) found racial minorities were less likely than whites to receive a physician recommendation for CRC screening and low-income rural women with low CRC screening rates indicated that less than 25% had ever been given information or education about CRC screening or given an FOBT screening by a provider (Davis et al., 2017).

Limitations of Literature Review Process

The Community Preventative Service Task Force (2013) recommended multimodal interventions including various strategies to increase colorectal cancer screening based on previous strong evidence of their effectiveness, including recommendations oriented specifically towards providers. Although multimodal interventions are recommended, the decision was made to limit the proposed DNP project on strategies solely affecting providers due to budgetary constraints and the limited project timeframe. The proposed DNP project strategies were limited to utilizing provider reminder and recall systems that remind or alert the provider that a patient is due or overdue for colorectal cancer screening. However, current literature within the last five years specifically regarding the use of provider reminder and recall systems is somewhat limited. As such, it was necessary to include within the literature search information related to multimodal interventions, although it is difficult to ascertain what percentage of screening increase is due specifically solely to the provider interventions. In addition, it was necessary to expand the literature search to include other types of cancer screening and preventive services and not solely rely on literature specifically related to colorectal cancer screening.

Discussion

Conclusion of findings. Provider reminders have been shown to increase the rates of preventative services, vaccinations, and cancer screenings (Gutierrez et al., 2017; Onders et al., 2014; Siembida et al., 2017; Zimet et al., 2017). The addition of an electronic medical record alert or reminder has been shown to successfully improve CRC screening along with other interventions (Feldman et al., 2017; Adams et al., 2018; Joseph et al., 2016; Mader et al., 2016) and the use of EMR reminders alone have been shown to increase CRC screening rates (Guiriguet et al., 2016; Kim et al., 2018). The use of patient lists also improved CRC screening

rates (Baxter, et al., 2017) along with provider recommendation of screening (Peterson et. al, 2016).

Advantages and disadvantages of findings. The Community Preventative Service Task Force (2013) recommended various strategies to increase colorectal cancer screening based on previous strong evidence of their effectiveness. However, current literature within the last five years regarding the use of provider reminder and recall systems is limited in terms of colorectal cancer screening. Many studies found in the literature search included multi-modal interventions; while EMR provider prompts and patient lists are included in the interventions utilized, determining how much of the increase in CRC screening rates is solely due to EMR provider prompts and patient lists is not possible.

However, the addition of an EMR provider prompt and a daily patient list are both cost-effective interventions for clinics currently utilizing an electronic medical record. There are often no costs associated with the addition of an EMR prompt or a daily patient list for clinics with an already established EMR, and the determination of the intervention's effectiveness can be easily determined with an electronic medical record chart review. In clinics not already utilizing interventions to increase CRC uptake, the addition of an EMR provider prompt or a daily patient list can be appropriate first steps to increasing CRC uptake.

Utilization of findings in practice. An Eastern NC FQHC does not currently have an EMR provider prompt for CRC screening, although there are currently other EMR prompts utilized for other preventative service screenings. The addition of an EMR prompt for CRC screening will be added to the currently used EMR program. For all eligible adults ages 50-75 years old presenting to the clinic for a visit, the electronic medical record will open a pop-up reminder to the provider upon opening the client's chart indicating that the adult has not had a

documented colorectal cancer screening. This pop-up reminder will alert the provider that the client has not yet received colorectal cancer screening. The provider will need to manually close the pop-up prior to continuing in the patient chart. A daily list will be printed of all scheduled patients for the following clinic day who do not have documented colorectal cancer screening. This list will be made available for the provider's use throughout the clinic day.

Summary

Provider recommendation (Duffy, Myles, Maroni, & Mohammad, 2017; Peterson et. al, 2016) and provider reminder and recall systems (CPSTF, 2013) are important strategies to utilize in order to increase cancer screening rates. Although evidence demonstrates the success of multicomponent multimodal interventions on CRC screening rates (CPSTF, 2013), evidence does show CRC screening increases with unimodal interventions such as use of patient lists (Baxter et al., 2017; Joseph, Redwood, DeGroff & Butler, 2016) and EMR reminders (Guiriguet et al., 2016; Kim et al., 2018). The proposed DNP project focused on those strategies solely affecting providers due to budgetary constraints and the limited project timeframe. As the site had no interventions in place to increase CRC screening, the goal was to increase CRC screening rates with implementation of provider-focused interventions.

Chapter Three: Theory and Concept Model for Evidence-based Practice

The purpose of this chapter is to understand the theory and concept model for evidence-based practice as it pertains to the DNP project. The nursing theory model utilized was the Health Belief Model. As the DNP Project concerned an organizational practice change, the model driving EBP change utilized was Kotter's Change Theory.

Concept Analysis

For the purposes of the project, *colorectal cancer screening* was any testing recommended by the USPSTF performed to detect the presence of colorectal cancer, including colonoscopy, stool based testing including FIT (fecal immunochemical test) and FOBT (fecal occult blood test), or flexible sigmoidoscopy every 5 years combined with high-sensitivity FOBT every 3 years (ACS, 2017; CDC, 2018a; USPSTF, 2017). *Colorectal cancer screening for average risk adults* started at age 50 years and continued until age 75 years; *average risk* referred to asymptomatic adults who do not have a family history of known genetic disorders that predispose them to a high lifetime risk of colorectal cancer, a personal history of inflammatory bowel disease, a previous adenomatous polyp, or previous colorectal cancer (USPSTF, 2017). A *Federally Qualified Healthcare Center (FQHC)* was a healthcare center providing comprehensive services to an underserved population with a sliding fee scale and which qualified for funding under Section 330 of the Public Health Service Act and for enhanced reimbursement from Medicare and Medicaid (Federally Qualified Health Centers, 2017).

Theoretical Framework

The Health Belief Model (HBM) is a socio-psychological model addressing behavior change (Rosenstock, Strecher, & Becker, 1988). The HBM suggests that a person's belief in a personal threat of an illness or disease together with a person's belief in the effectiveness of the

recommended health behavior or action will predict the likelihood the person will adopt the health behavior (LaMorte, 2018). For the purpose of the DNP project, the model serves to help assess health-seeking behavior and participation in regards to colorectal cancer screening uptake. The HBM details that there are six main constructs which can influence people's decisions about whether to take action to prevent, screen for, and control illness (National Cancer Institute, 2005; Rosenstock, Strecher, & Becker, 1988). The HBM suggests that individuals are ready to act if they believe they are susceptible to the condition or disease (*perceived susceptibility*), believe the condition has consequences (*perceived severity*), believe taking action would reduce their susceptibility to the condition or its severity (*perceived benefits*), believe the tangible or psychological costs of taking action (*perceived barriers*) are outweighed by the benefits, are exposed to factors that prompt action such as a provider reminder to get screening (*cue to action*), and/or are confident in their ability to take action and succeed (*self-efficacy*) (NCI, 2005; Rosenstock, Strecher, & Becker, 1988). However, it is important to note that not all seven of these constructs must be perceived by the individual in order to act.

Application to practice change. The six constructs of the Health Belief Model pertain to the individual's choice to participate in colorectal cancer screening. However, the DNP project aims to improve provider compliance with offering CRC screening, so the Health Belief Model constructs must also be applied to the provider. Perceived susceptibility reflects that a patient believes that he or she could get colorectal cancer; the provider must also be aware of and believe that the patient could get colorectal cancer. In addition, the act of the provider recommending screening could increase the patient perception that they could get colorectal cancer. Perceived severity is that the patient believes the consequences of colorectal cancer without detection or treatments are severe enough to try to avoid; the provider must also believe

that the detection and treatment could lessen the severity. Of note, provider education of the patient could also affect the patient perception of severity. Perceived benefits are that the recommended colorectal cancer screening would help detect the potential colorectal cancer earlier and prevent more invasive treatments or death; both provider and patient must believe in these benefits. Perceived barriers are when patients identify their personal barriers to participating in colorectal cancer screening; perhaps they feel a colonoscopy is too invasive of a procedure, or the colon preparation is too intense. In terms of other types of screenings, perhaps they do not want to handle their own stool for the stool-based testing. In any event, ways must be explored by the provider to eliminate or reduce those barriers—in these cases, to potentially utilize an alternative method of screening to overcome those barriers and to offer these alternative methods. Other barriers could be cost of screening, or transportation issues. Cues for action are reminder cues; in this case, the provider suggesting participation in colorectal cancer screening at the clinic visit, facilitated by the use of the EMR reminder and the daily patient list. Self-efficacy is when the patient feels confident in participating in colorectal cancer screening and does so (LaMorte, 2018; Rosenstock, Strecher, & Becker, 1988); the provider offering and recommending screening can significantly impact patient self-efficacy.

The Health Belief Model concerns the constructs of a patient believing they are at risk of a certain condition and making decisions based on decreasing that risk; provider endorsement of CRC screening can help to educate the patient regarding their actual risk and encourage the decision to participate in screening. Provider recommendation has been associated with increased patient participation in breast, cervical, and colorectal cancer screening (Duffy, Myles, Maroni, & Mohammad, 2017; Peterson et al., 2016). Increasing provider recommendation rates by use of provider prompts could help cue the patients for action.

EBP Change Theory

Kotter's Change Management Model (1996) consists of an eight-stage process of leading and implementing organizational change initiatives. These stages include establishing a sense of urgency for the change, creating the guiding coalition who can lead the change, develop a vision and strategy, communicating the change vision, empowering broad-based change, generating short-term wins, consolidating gains and producing more change, and anchoring new approaches in the organization (Kotter, 1996). Kotter organizes each of these steps into three distinct phases. The first phase encompasses the first four steps in the process and help to break down the status quo of current practice behaviors. The second phase, comprised of steps five to seven, introduces new practices in the organization. The third phase, which comprises only the last of the eight steps, then grounds the changes and solidifies them into the practice culture (Kotter, 1996).

Application to practice change. Kotter's Eight-Step Change Model (Kotter, 1996) was utilized to guide the practice change project. In the first step, a sense of urgency was created by determining the low rates of colorectal cancer screening uptake at the Eastern NC FQHC and demonstrating the potential harm to patients due to not having timely colorectal cancer screening. During the second step, a coalition of staff members committing to making the change and authority to lead the change was organized; this coalition included the Associate Medical Director and the Director of Quality Improvement. In the third step, developing a vision and strategy, involved creating the vision for the new process changes after a review of the available literature (in this case, the use of an EMR reminder and a daily patient list). During the fourth step, an educational session was performed for the medical providers and staff to communicate the new process. This session detailed the process changes and provided

educational information regarding colorectal cancer screenings (see Appendix B and Appendix C) and the current rates of screening in the practice. During step five, the Medical Assistants were empowered by creating a sense of patient list ownership and were encouraged to provide feedback. In step six, identifying quick wins, reinforced the impetus for change. A quick win in this example was that all staff could easily determine daily which patients did not have documented evidence of colorectal screening prior to the visit by the use of the patient list and this could easily be rectified. Another quick win was that providers were able to more easily identify which patients needed colorectal cancer screening due to the EMR reminder and daily patient lists and improve their screening rates. Both step seven (consolidating gains and producing more change) and step eight (anchoring new approaches in the organization) involved integrating and sustaining the changes in the clinic. Post-implementation effectiveness of the changes could play a role in improving patient care, and continued stressing of participating in the new practice changes continued after the implementation period.

Summary

The Health Belief Model serves as the theoretical basis for the DNP project. The Health Belief Model concerns the constructs of a patient believing they are at risk of a certain condition and making decisions based on decreasing that risk (LaMorte, 2018; Rosenstock, Strecher, & Becker, 1988); the DNP project of provider prompting helps the patient make decisions (in this case CRC screening) to help minimize risk. The model driving EBP change and serving as an organizational framework for the project was Kotter's Change Theory. Utilizing the eight steps of Kotter's Change Theory guided the development and implementation of the project in a structured method.

Chapter Four: Pre-implementation Planning

The pre-implementation planning phase of the DNP project provided an opportunity to build out a detailed project plan in preparation for project implementation. This chapter's purpose is to provide details on the project purpose, project management, cost of materials, plans for IRB approval, and plans for project evaluation.

Project Purpose

The purpose of the DNP project was to increase provider delivery of the available colorectal screening options by the use of provider prompts. The project utilized an EMR pop-up reminder and a daily list of average-risk patients age 50-75 that did not have current CRC screening documented in the EMR to prompt providers to offer CRC screening.

Project Management

Organizational readiness for change. The need for organizational change in terms of colorectal cancer screening policy and procedures was clear. The organization was not meeting the organization's 60% screening rate goal (L. Avery, personal communication, August 27, 2018). Clinic screening rates also did not meet the current national FQHC screening rate of 42.02% (Health Resources and Services Administration, 2017). However, FQHC administration and senior leadership were eager to improve screening rates, were willing to participate in the DNP project, and actively supported the project. Minimal time and resources were needed to perform the DNP project; there was already an EMR system in place that was able to utilize an EMR prompt. There was also a program in place allowing Medical Assistants to print off a daily patient list indicating a patient's colorectal cancer screening status with minimal time or effort. There were no other major changes scheduled to take place at the time of the DNP project; it was

hoped that this would help with employees' willingness to implement and sustain the quality improvement effort of the DNP project.

Inter-professional collaboration. *Medical providers* were the focus of the project; they were responsible for offering the CRC screening options to patients and were prompted to do so by the EMR reminder and the daily patient list. *Medical assistants* printed the patient list daily for provider use. The *Director of Quality Improvement* served as a resource for project planning and for institutional approval. The project *Site Champion* (the Associate Medical Director/Practice Manager) served as a resource for project planning and also helped develop the project for institutional approval.

Risk management assessment. A SWOT Analysis was utilized to develop a needs assessment of the proposed project. Internal strengths included that there were FOBT cards already available for use in the clinics at a reduced cost. In addition, there was an on-site representative for a program called Health Assist, which could secure a no-cost colonoscopy for a patient with positive FOBT- based testing results. An internal weakness was related to the busy FQHC provider's perceived or actual lack of time during the clinic visit to discuss CRC screening options and recommendations with patients. Another possible weakness was potential patient dislike of CRC screening and the available screening options in the clinic; FOBT cards require the patient to handle one's own stool, while colonoscopy requires intensive bowel-cleansing preparation which can be difficult for some patients to tolerate. External opportunities were easy access and application to programs that could help with healthcare costs, such as the healthcare insurance marketplace, Medicare/Medicaid, and Health Assist. Acceptance to any of these programs could help decrease access to care issues. Threats included changes in the current political climate; future changes could be made to the healthcare marketplace and

insurance coverages making it more difficult for patients to access care. In addition, the FQHC serves a predominantly Spanish-speaking immigrant population; fear of immigration reporting could serve as a deterrent for undocumented persons and they may not want to apply for the available programs which could help with screening costs. Threats were mitigated to the extent possible. The Eastern NC FQHC patient population serves patients with no insurance, so although potential changes to insurance coverage could take place, patients will still be seen. In terms of documentation, the FQHC does not report undocumented persons to immigration and clinic staff reassures patients to the extent possible.

Organizational approval process. The Eastern NC FQHC administration was eager to improve CRC screening rates and was willing to participate in the proposed DNP project with a minimum of discussion. After meeting with the Associate Medical Director/Practice Manager of the clinical site, the Director of Quality Improvement, and the Director of Clinical Services individually, all signed on to the proposed project with no changes to the project required. In addition, it was specified by the clinic administration that there would be no institutional IRB required (See Appendix D).

Information technology. The FQHC uses an electronic medical record program which allows for addition of an EMR prompt to be built into the system. Another program used by the FQHC is one also used by Community Health Centers to monitor Quality Improvement measure compliance and extracts data from the electronic medical record; this is the program that was used by the Medical Assistants to print off the daily patient lists of patients without current CRC screening. Project data was input into a Microsoft Excel spreadsheet (See Appendix E) and data was analyzed using Excel and SPSS.

Cost Analysis of Materials Needed for Project

Educational session handouts were provided at no-cost through the CDC website (See Appendix B and Appendix C). If additional handouts were required, they were printed at a minimal cost utilizing the FQHC printers available at the clinical site. The EMR reminder incurred no additional cost to the clinic to implement. The daily patient lists required one sheet of paper daily per provider, again, at a minimal cost to the clinic.

Plans for Institutional Review Board Approval

Institutional training requirements for persons involved in the conduct of human research were completed by the project lead during the period of project development. Specifically, Collaborative Institutional Training Initiative (CITI) for the Protection of Human Resource Subjects was required prior to IRB submission and completed. University & Medical Center Institutional Review Board (UMCIRB) standard operating practices were followed throughout the IRB approval process. The IRB application was submitted only after the DNP project proposal was reviewed and accepted by DNP faculty. While IRB approval was sought, it was determined to not be required for this Quality Improvement project as there is no human research involved (See Appendix F). Institutional IRB approval was not required for this project (See Appendix D).

Plan for Project Evaluation

Demographics. Demographic information was collected regarding provider's professional roles, years of primary care practice and certification (See Appendix G). This data was analyzed using descriptive statistics and reported at the end of the project.

Outcome measurement. Baseline data was collected prior to project implementation on CRC screening rate participation via EMR data mining and manual chart reviews. This provided data on the number of encounters in compliance prior to the project; it was also important to note

if documentation of completed CRC screening was being noted in the appropriate area of the EMR for data mining purposes.

On a weekly basis, the hard copies of daily patient lists were reviewed and correlated with the EMR documentation. Patient chart reviews were also performed on a weekly basis to evaluate if CRC screening was both offered and completed; this was reflective if the program was implemented as planned. After the period of program implementation was completed, a comparison was made between the baseline data and the post-implementation data to determine if there was an increase in screening and screening uptake after the interventions. Successful evaluation would indicate that the use of a daily patient list and EMR reminder prompt increased provider compliance with offering and recommending CRC screening in order to improve CRC screening uptake for those patients who were not in compliance with this measure. The ultimate goal was to improve CRC screening rates, leading to increasing earlier detection rates and ultimately decreasing mortality rates from colorectal cancer. However, the limited project timeline precluded analysis of mortality rates as a reported project outcome measure post-implementation.

Evaluation tool. Data was collected in terms of (1) how many patients were seen in clinic weekly, (2) how many patients had current documentation of CRC screening in chart prior to clinic visit, (3) was CRC screening offered at clinic visit, (4) was the daily patient list provided for the providers, and (4) how many patients had current documentation of CRC screening in chart at end of project. Data collected was input manually into an Excel spreadsheet (See Appendix E) and reported as total sums.

Data analysis. Medical assistants submitted the daily patient list sheets to a predetermined collection box for weekly evaluation and the number of patients seen was totaled

on a weekly basis. The hard copies of daily patient lists were reviewed and correlated with the EMR documentation on a weekly basis. Patient lists and charts were evaluated weekly to determine if CRC screening was offered; this was reflective if the program was implemented as planned. A comparison will be made between the baseline data and the post-implementation data to determine if there is an increase in screening and screening uptake after the interventions.

Data management. An Excel spreadsheet was used to record numerical data for the following questions: (1) how many patients were seen in clinic weekly, (2) how many patients with current documentation of CRC screening in chart prior to clinic visit, and (3) how many patients with current documentation of CRC screening in chart at end of project. Yes and no responses were coded and input into SPSS for the following: (1) was CRC screening offered at clinic visit, (2) was the daily patient list provided for the providers. All project data collected was input manually into an Excel spreadsheet (see Appendix E) and reported as total sums. The data input was encoded into SPSS and reported using descriptive statistics. All project data was transcribed manually by the project lead. Data was stored on the FQHC computer and the project lead's laptop; only numerical data, yes/no responses, or provider demographic data was recorded. No identifying patient data was collected or saved.

Summary

The pre-implementation planning phase detailed the DNP project plan. The purpose of the DNP project was to increase provider delivery of the available colorectal screening options by the use of provider prompts including an EMR reminder prompt and a daily patient list. Outcomes measurement and project evaluation details provided a guide for the project.

Chapter Five: Implementation Process

This chapter details the implementation process of the DNP quality improvement project. A design appropriate to the purpose of the project was developed based on the evaluation of the evidence, needs assessment, and overall project goals. The clinical setting, details of the project timeline, the project process, and a plan for how data was analyzed are discussed.

Setting

The DNP project took place at an Eastern NC Federally Qualified Health Center (FQHC) belonging to a network of six community health center sites in multiple Eastern NC counties. These clinics provide a range of medical, dental, and therapy care. At all clinical sites, services are also specifically provided for migrant and seasonal farmworkers and also services are provided in regards to how the clients can attain insurance coverage. The over-arching company focus is reaching the underserved, uninsured, and underinsured, although all insurances and cash pay are accepted. The project site was staffed with a combination of Physicians, Physician's Assistants, and Nurse Practitioners. Each medical provider had an assigned Medical Assistant.

Nor the Eastern NC FQHC or the network of community health centers had a specific policy or procedure in place for colorectal cancer screening. There were other EMR prompts utilized for various preventative service screenings, but there was no EMR provider prompt for CRC screening.

Participants

All of the clinic Primary Care Providers (PCPs) including Physicians (both MD and DO), Nurse Practitioners, and Physician's Assistants and their patient populations were included in the project. Eligible patients were those who did not have documented current colorectal cancer screening in the EMR and who were considered to be average risk. Average risk was defined as

asymptomatic adults aged 50-75 years old who (1) did not have a family history known genetic disorders linked to colorectal cancer, (2) a personal history of inflammatory bowel disease, (3) a previous adenomatous polyp, or (4) previous colorectal cancer (USPSTF, 2017).

Recruitment

There was no specific recruitment process as all providers working at the clinic site were required to participate in the practice change.

Implementation Process

An educational session was held prior to project implementation to increase provider/staff knowledge regarding CRC screening and the project intervention. Education was provided regarding the proper location to document completed CRC screening in the chart. Handouts were provided for clinic and staff use regarding current CRC screening recommendations (See Appendix B and Appendix C). Providers were educated on the appearance and appropriate use of the EMR prompt; clicking on the prompt indicates that CRC screening was discussed and offered in the clinic visit. Medical assistants were educated on how to print off the daily patient list. Both medical assistants and providers were educated on how to utilize the daily patient list to both recognize that a patient did not have current CRC screening in their chart and how to notate that the CRC screening was offered on the daily patient list. Medical assistants were instructed to submit the daily patient list sheets to a predetermined collection box for weekly evaluation purposes.

Plan Variation

Clinic staffing changes decreased the number of providers taking part in the project. Two full-time physicians left the clinic immediately prior to project implementation. A full-time physician started at the clinic after the start of project implementation and was not included in

the project data collection process. Provider vacation time prevented the participation of another physician, as the physician was not present at the clinic during the majority of the project implementation dates.

Summary

While pre-implementation planning detailed the project flow and timeline, there were concerns due to changes in clinic personnel during the implementation period. However, these changes required no variation from the defined implementation plan. A design appropriate to the purpose of the project was developed based on the evaluation of the evidence, needs assessment, and overall project goals and was successfully implemented with minimal changes. The clinical setting and project process remained unchanged throughout project implementation. Analysis of project data occurred after implementation was complete.

Chapter Six: Evaluation of the Practice Change Initiative

The evaluation of the practice change phase of the DNP project assessed the actual implementation period of the DNP project. This chapter's purpose is to provide details on the project implementation process and the DNP project results.

Participant Demographics

There were five total provider participants in the DNP project. Originally there were several more providers planned for inclusion in the project, but due to staffing changes and provider vacations, only five in total were eligible for the duration of the project implementation period for inclusion in the project. Providers who participated in the DNP project had a range of 2 to 37 years of primary care experience (M=13, SD =14.87). Participant demographics included 20% NP (n=1), 60% MD (n=3), and 20% PA (n=1), with 60% of providers certified in Family Medicine (n=3) and 40% certified in OB/GYN (n=2). Providers who participated in the DNP project were classified as 60% full-time (n=3) and 40% part-time (n=2).

Intended Outcomes

The project's goal was to improve provider compliance with offering colorectal cancer screenings and improved colorectal cancer screening rates in the clinic. The project utilized an EMR pop-up reminder and a daily list of average-risk patients age 50-75 that did not have current CRC screening documented in the EMR to prompt providers to offer CRC screening.

Findings

Baseline data was collected prior to project implementation on CRC screening rate participation via EMR data mining and manual chart reviews. This provided data on the number of encounters in compliance prior to the project; it was also important to note if documentation of completed CRC screening was being recorded in the appropriate area of the EMR for data

mining purposes. Over the eight week project implementation period, 373 eligible patients were seen in the clinic. Of the 373 eligible patients, 184 had current documentation of CRC screening in the chart prior to the clinic visit. However, of the 184 patients with current documentation of CRC screening in the chart, only 163 had the screening documented appropriately in the correct location in the chart for data mining purposes. Approximately one month after the project implementation period ended, 212 of the original 373 eligible patients had current CRC screening documented correctly in the chart.

It is important to note that 49.3% (n=184) of eligible patients had current CRC screening during the project implementation period; however, due to incorrect documentation of current CRC screening, only 43.6% (n=163) were indicated as having current CRC screening. The baseline screening rate was already higher than the 33% of the FQHC's eligible patients with current CRC at the beginning of the DNP project development in August 2018 (L. Avery, personal communication, August 27, 2018). It is also noteworthy that the percentage of eligible patients with current CRC screening during the project implementation period is on par with the current national FQHC screening rate of 42.02% (Health Resources and Services Administration, 2017), although still lower than the clinic's 60% screening rate goal. 11.4% (n=21) of the 184 patients had current documentation of CRC screening in the chart but were documented incorrectly in the chart for data mining purposes; as this 11.4% was not documented correctly, the clinical site's software would not have populated these patients as having current CRC screening. The DNP project did not evaluate walk-in acute visits, although these numbers would have been counted towards the clinic numbers as a whole and conceivably could have pulled down the final percentages.

Approximately one month after the project implementation period ended, 212 of the original 373 eligible patients had current CRC screening documented correctly in the chart. This was an increase from the 184 patients with current documentation of CRC screening in the chart at the beginning of the project implementation period. After the program implementation period, 28 additional patients had current CRC screening in the chart. This is an increase to 56.8% from the baseline 49.3% of the eligible patients. As screening rates improved, the DNP project was successful. Successful project evaluation indicated that the use of a daily patient list and EMR reminder prompt increased provider compliance with offering and recommending CRC screening in order to improve CRC screening uptake for those patients who were not in compliance with this measure. However, it is important to note that there was no method utilized to determine which the provider prompting interventions led to the ultimate goal of improving CRC screening rates. The EMR prompt required the providers to click out of the prompt prior to entering the patient's chart; although the patient list was available for provider use, there was no specific evaluation utilized during the project implementation period to determine the frequency with which providers were using it. Although it was difficult to determine precisely which intervention led to the improvement, CRC screening rates did improve. The overarching goal was to improve CRC screening rates leading to increasing earlier detection rates and ultimately decreasing mortality rates from colorectal cancer. However, the limited project timeline precluded analysis of mortality rates as a reported project outcome measure post-implementation.

Summary

Due to time constraints of the project, along with unpredictable numbers and limited provider participants, evaluating the effectiveness of the process itself (i.e., if colorectal cancer screening rates improved due to the project) was not feasible. However, there was an increase in

colorectal screening rates from the baseline 49.3% of the eligible patients up to 56.8% one month after the project implementation period ended. It is important to note that the baseline screening percentage in CRC screening rates was also improved due to determining and correcting incorrect documentation of previously completed CRC screenings for data mining purposes. In addition, acute visits were not evaluated as part of the DNP project and these types of visits could drive down the completed CRC screening percentage rates.

Chapter Seven: Implications for Nursing Practice

The American Association of Colleges of Nursing's (AACN) Doctor of Nursing Practice (DNP) Essentials (2006) "outline the curricular elements and competencies that must be present in programs conferring the Doctor of Nursing Practice degree" (p. 8). The eight DNP essentials were used to support the development and guide the implementation of this quality improvement project. This chapter's purpose is to provide details on how the eight DNP essentials were reflected throughout the DNP project and potential implications for nursing practice.

Practice Implications

Practice implications are suggestions or recommendations for how to use what was discovered through this quality improvement project for the advancement of nursing practice. The results of this quality improvement project may now be transitioned into future practice improvements for the DNP project's clinical site. In this quality improvement project, provider delivery of the available colorectal screening options was improved by the use of provider prompts, specifically an EMR pop-up reminder and a daily list of average-risk patients age 50-75 that did not have current CRC screening documented in the EMR.

Essential I: Scientific underpinnings for practice. The first DNP Essential addresses the scientific foundation for nursing practice (AACN, 2006). At the beginning of the DNP project's formation, a literature review was performed to elaborate upon the significance of the project's clinical problem and to identify evidence-based solutions. Analyzing the evidence-based research led to the development and implementation of a quality improvement project which improved colorectal cancer screening rates in an Eastern NC FQHC. The interventions utilized in the DNP project led to positive results; utilizing similar practices in the future could be utilized for other improvements in clinical practice and outcomes.

Essential II: Organization and systems leadership for quality improvement and systems thinking. The second DNP Essential addresses the requirement that DNP graduates be "proficient in quality improvement strategies and in creating and sustaining changes at the organizational and policy levels" (AACN, 2006, p. 10). Proficiency in quality improvement strategies, as demonstrated by the development and successful implementation of this DNP quality improvement project with input from the organization's administration, and promoting lasting organizational changes in the future based on evidence-based quality improvement strategies are key components of this DNP Essential. This DNP project successfully demonstrated the use of specific interventions to improve quality improvement outcomes; these interventions should continue to be utilized in the organization in the future to sustain improved quality improvement outcomes. Continued input and support throughout the project from the organization's administration reflect the project's future organizational sustainability. The quality improvement project was developed incorporating principles of change; this, and clearly and effectively communicating the project results to the clinical staff can help ensure consistent adherence to quality improvement in future.

Essential III: Clinical scholarship and analytical methods for EBP. The third DNP Essential indicates that the DNP prepared advance practice nurse "design, direct, and evaluate quality improvement methodologies to promote safe, timely, effective, efficient, equitable, and patient-centered care" (AACN, 2006, p. 12). The DNP project was originally formulated based on the knowledge that colorectal cancer screening rates at an Eastern NC FQHC were unacceptably low. After completing a literature review and determining findings from evidence-based research, this essential helped guide project development to improve provider compliance with offering colorectal cancer screening. Through critical analysis of the literature, it was

determined that best practices supported the use of the daily patient list and EMR reminder to improve colorectal screening rates. Use of the provider reminders utilized during this quality improvement project should remain in place beyond the project implementation period into the future to continue to alert providers of eligible patients who do not have updated CRC screening. In addition, these interventions could be utilized for other screenings or vaccinations and can continue to further future quality improvement projects in the organization. Dissemination of the project findings to the organization will help the organization determine potential best practices in future projects.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare. The fourth DNP essential indicates that the DNP prepared advance practice nurse be **"**proficient in the use of information systems/technology resources to implement quality improvement initiatives and support practice and administrative decision-making" (AACN, 2006, p. 13). The use of the EMR system already in place at the clinic site for the development and implementation of the DNP project reflects the use of information systems and technology. The DNP project consisted of extracting CRC screening data from the clinical EMR in order to improve provider compliance with offering CRC screening to improve CRC screening rates. In addition, EMR data mapping issues were discovered during the DNP project. Specifically, patients with current CRC were not being counted as current due to their current CRC screening being documented in a location that was not mapped by the EMR. This issue was communicated to clinic administration at the end of the project in the hopes that the issue could be corrected for the organization, and potentially could be communicated to other organizations utilizing the same EMR program.

Essential V: Healthcare policy for advocacy in healthcare. The fifth DNP essential indicates that the DNP graduate is prepared "to assume a leadership role in the development of health policy" (AACN, 2006, p. 13). For the purposes of the DNP project, it was important to identify a problem within the organization and potential solutions at the institutional level. In a broader scope, this essential reflects that the DNP graduate advocates for equitable and ethical health care. Analyzing obstacles to increased compliance with CRC screening rates could lead to development and implementation of policies that could increase access to care, promote more affordable CRC screening methods, or offer CRC screening methods regardless of ability to pay.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. The sixth essential indicates that the DNP graduate be enabled "to facilitate collaborative team functioning and overcome impediments to interprofessional practice" (AACN, 2006, p. 14). For this project, a DNP student took the leadership role in the development and implementation of the quality improvement project. DNP student synthesis of information determined by a literature review led to the development of the project in order to improve quality. Successful project implementation and positive project results reflect that future projects led by DNP students can be beneficial to health organizations.

Essential VII: Clinical prevention and population health for improving the nation's health. The seventh essential provides the foundation in clinical prevention and population health which enables DNP graduates "to analyze epidemiological, biostatistical, occupational, and environmental data in the development, implementation, and evaluation of clinical prevention and population health" (AACN, 2006, p 15). Evaluating and interpreting evidence-based data and information regarding CRC screening was performed in an effort to improve the health of the organization's population. Although this DNP quality improvement project had a

provider focus, future patient-driven focused organizational projects could use different health promotion and disease prevention strategies from a patient-focused perspective to address further increasing CRC screening rates.

Essential VIII: Advanced nursing practice. The eighth essential reflects the DNP graduate's preparation to practice in "an area of specialization within the larger domain of nursing" (AACN, 2006, p. 16). Demonstrating advanced levels of clinical judgement, systems thinking, and delivery of evidence-based care (AACN, 2006, p. 16) can lead to the ultimate goal of improving patient outcomes. Designing, implementing, and evaluating interventions to promote quality were the hallmarks of the planning portion of the DNP quality improvement project. Conducting a systematic assessment of the organization and population's needs led to the development of the DNP project. Throughout the DNP project, support was offered for the clinical staff and providers experiencing the change in the CRC screening process.

Summary

The eight AACN DNP Essentials (2006) were used to support the development and guide the implementation of this quality improvement project. The results of this quality improvement project may now be transitioned into future practice improvements for the DNP project's clinical site. Through evidence-based research and analysis of information, interventions utilized in the DNP project led to positive results. A key practice implication for future advanced nursing practice is that utilizing similar practices and interventions in future projects could lead to other improvements in clinical practice and outcomes. Use of the provider reminders utilized during this quality improvement project should continue beyond the project implementation period into the future to continue to alert providers of eligible patients who do not have updated CRC

screening. In addition, these interventions could be utilized for other screenings or vaccinations and can continue to further future quality improvement projects in the organization.

Chapter Eight: Final Conclusions

This DNP project was implemented in order to increase provider delivery of colorectal screening options by using provider prompts. Provider prompts included in the DNP project were an Electronic Medical Record (EMR) pop-up reminder and daily lists of patients who did not have current CRC screening documented in the EMR. The DNP project was successful, as the use of provider prompts led to the ultimate goal of improving clinic CRC screening rates.

Significance of Findings

There was an increase in completed colorectal screening rates from the baseline 49.3% of the eligible patients up to 56.8% one month after the project implementation period ended. It is important to note that the baseline screening percentage in CRC screening rates was also improved due to determining and correcting incorrect documentation of previously completed CRC screenings for data mining purposes. Although the DNP project interventions were simplistic, a considerable increase in CRC screening was noted. It is important for healthcare organizations to take part in what interventions they can easily afford and are available to them, because good results can come from small changes. In addition, an important issue with incorrect documentation was discovered during the DNP project; the organization will need to evaluate if documentation errors could be artificially driving down other key performance values.

Project Strength and Limitations

Project strengths included the minimal time and resources needed to perform the DNP project. There was already an EMR system in place that was able to utilize an EMR prompt. There was also a program in place allowing Medical Assistants to print off a daily patient list indicating a patient's colorectal cancer screening status with minimal time or effort. Educational

handouts were provided at no cost through the CDC. Other than the minimal cost of paper for the daily patient lists and handouts, there were no financial costs incurred to the organization due to project participation. The project design was relatively simple and the use of the daily patient list and the EMR reminder did not require a significant time burden for provider participation. In addition, FOBT cards were available at a reduced cost at the clinic with a current program in place to secure a no-cost colonoscopy for a low-income patient with positive FOBT- based testing results.

During the project planning phase, there were no other major changes scheduled to take place at the time of the DNP project which improved employees' willingness to implement and sustain the quality improvement effort of the DNP project. FQHC provider's perceived or actual lack of time during the clinic visit to discuss CRC screening options and recommendations with patients were likely still an issue with project implementation, although there were no means to assess this potential concern during the project. Although it was verified daily that the patient lists were available for provider use, there was no specific method to evaluate the level of provider utilization during the DNP project. Clinic staff changes at the time of project implementation led to limited provider participants. Unpredictable patient numbers were also a project limitation, and only scheduled patient visits were included in the project. Acute visits were not included in the project and the inclusion of acute visits could have decreased the completed CRC screening percentage rates.

Project Benefits

There was an increase in completed colorectal screening rates from the baseline 49.3% of the eligible patients up to 56.8% one month after the project implementation period ended. The increase in CRC screening rates demonstrated that the project interventions were beneficial. The

ultimate project goal of improving CRC screening rates was met. It was hoped that improved CRC screening rates would lead to increasing earlier detection rates and ultimately decreasing mortality rates from colorectal cancer. Although the limited project timeline precluded analysis of mortality rates as a reported project outcome measure post-implementation, increasing CRC screening rates is a good first step.

Recommendations for Practice

A future project will need to include and evaluate acute visits. Evaluation of a similar project over a longer period of project implementation would be beneficial in order to determine if the quality improvement measures could be sustained for a longer period of time. This quality improvement project provided the daily patient lists for provider use, but evaluation of the provider's actual use of the daily patient lists was limited; further projects with clearer analysis of the provider use of patient lists would be beneficial. Also, a potential future project could be directed towards Medical Assistant use of daily patient lists, which could potentially decrease the provider time burden even further. An interesting potential future project would be if Medical Assistants could offer FOBT screening cards with a standing order, without the need for provider inclusion.

Final Summary

In conclusion, the DNP project of provider prompting was fundamentally successful, as project results indicated an increase in completed colorectal screening rates from the baseline 49.3% of the eligible patients up to 56.8% after project completion. The interventions utilized in the DNP project were simple and cost-effective, particularly for a practice already utilizing an electronic medical record. Although the increase in colorectal cancer screening rates did not reach either the clinical site's goal or national goals for screening, progress has been made

towards those goals. The discovery and correction of a data mapping issue in the EMR was also beneficial for the clinical site. Continued efforts will need to be made by the clinical site to increase colorectal cancer screening rates, potentially through multi-modal interventions.

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Appendix A

Evidence Matrix

Author/ dates	**Title**	**Name of Journal**	**Purpose**	**Level of Evidence**	**Study Design**	**Sample Size**	**Key Point**
Adams, S., Rohweder, C., Leeman, J., Friedman, D., Gizlice, Z., Vanderpool, R., Askelson, N., Best, A., Flocke, S., Glanz K., Ko, L., & Kegler, M. 2018	Use of evidence-based interventions and implementation strategies to increase colorectal cancer screening in Federally Qualified Health Centers.	*Journal of Community Health*	To determine while evidence-based interventions to promote CRC screening are currently being used in FQHCs and which implementation strategies are being employed to ensure that the interventions are executed as intended	Level IV	Cross-sectional, self-administered web-based survey	56 FQHCs	Provider reminder and recall systems were the most commonly used evidence-based interventions, while the most commonly used implementation strategy was the identification of barriers
American Association of Colleges of Nursing. 2006	The essentials of doctoral education for advanced nursing practice.	*Not applicable*	Detail the curricular elements and competencies that must be present in programs conferring the Doctor of Nursing Practice degree	Level VII	None	None	8 DNP Essentials
American Cancer Society 2017	Colorectal facts and figures 2017-2019	*Not applicable*	Overview of colorectal cancer basic facts, occurrence rates, risk factors, screenings, and treatments.	Level VII	None	None	Recommended screening options include colonoscopy every 10 years, annual FIT (fecal immunochemical test), annual high-sensitivity FOBT (fecal occult blood test), or flexible sigmoidoscopy every 5 years combined

							with high-sensitivity FOBT every 3 years.
American Cancer Society 2018a	Cancer statistics center	*Not applicable*	Statistical information relating to North Carolina cancer incidence and mortality rates.	Level VII	None	None	There are estimated to be 4,440 new cases of colorectal cancer and an estimated 1,570 deaths in North Carolina in 2018.
American Cancer Society 2018b	Colorectal cancer screening for average-risk adults	*Not applicable*	CRC screening guideline update.	Level VII	None	None	No specific screening recommended more than any other; recommendations emphasize that offering options could increase screening rates
American Cancer Society 2018c	National colorectal cancer center roundtable	*Not applicable*	Coalition established by ACS to reducing the incidence of and mortality from colorectal cancer in the U.S.	Level VII	None	None	Goal of 80% of adults aged 50 and older being regularly screened for colorectal cancer by 2018.
Ananda, S., Kosmider, S., Tran, B., Field, K., Jones, I., Skinner, I., Guerrieri, M., Chapman, M., & Gibbs, P. 2016	The rapidly escalating cost of treating colorectal cancer in Australia.	*Asia-Pacific Journal of Clinical Oncology*	To calculate the stage-specific costs of treating patients with CRC in routine clinical practice and explore the cost of cancer care in the modern era.	Level VII	Retrospective analysis of data	Analysis of 2756 CRC patient records at 4 hospitals	Recent progress in the treatment of later stages of colorectal cancer (use of biologics) is being achieved at significant financial cost. Earlier stage diagnosis/treatment financially advantageous.
Baxter, N., Sutradhar, R., Li, Q., Daly, C., Honein-AbouHaidar, G., Richardson,	Do primary care provider strategies improve patient participation in colorectal cancer screening?	*American Journal of Gastroenterology*	To determine the effect of provider strategies to increase colorectal cancer screening in a single-payer system.	Level III	Population based cross sectional observational study	717 PCPs, 147,834 rostered patients	Majority of PCPs had adopted a practice-based strategy to improve screening participation (either at point of care,

D., Guidice, L., Tinmouth, J., Paszat, L., & Rabeneck, L. 2017							prompts and reminders, or patient list generation). Individual practice-based strategies not associated with screening uptake. Only PCP use of patient list generation associated with statistically significant screening uptake.
Best, A., Strane, A., Christie, O., Bynum, S., & Wiltshire, J. 2017	Examining the influence of cost concern and awareness of low-cost health care on cancer screening among the medically underserved.	*Journal of Health Care for the Poor and Underserved*	To examine the influence of concern about health care cost (cost concern) and awareness of low- cost health care (awareness) on cancer screening African Americans within an FQHC service area using self- report surveys.	Level VI	Research design self-reported survey	236 African Americans within an FQHC service area	Awareness was positively associated with cervical and CRC screening; cost concern was negatively associated with mammography screening. Results indicate that improving awareness and understanding of low- cost health care could increase cancer screening among underserved African Americans.
Center for Disease Control and Prevention 2017	Colorectal cancer control program.	*Not applicable*	The purpose of the CDC's Colorectal Cancer Control Program (CRCCP) is to increase colorectal cancer screening rates among people between 50 and 75 years of age.	Level VII	None	None	Goal of increasing screening on a population level; goal is 80%.
Center for	Colorectal cancer	*Not applicable*	Discussion of	Level	None	None	No single best test.

Disease Control and Prevention 2018a	screening tests.		available CRC screening tests.	VII			
Center for Disease Control and Prevention 2018b	U.S. cancer statistics data visualizations	*Not applicable*	United States cancer rates data visualization.	Level VII	None	None	2015: 1,633,390 new cases of cancer were reported; 595,919 people died of cancer in the U.S. For every 100,000 people, 438 new cancer cases were reported /159 died of cancer.
Community Preventative Services Task Force 2013	Cancer screening: Provider recall and reminder systems—colorectal cancer	*Not applicable*	Discussion of provider recall and reminder systems for CRC screening.	Level VII	None	None	The Task Force recommends provider reminder and recall systems on the basis of strong evidence of effectiveness in increasing screening by mammography for breast cancer, by Pap test for cervical cancer, and by FOBT for colorectal cancer.
Cooper, C. & Gelb, C. 2016	Opportunities to expand colorectal cancer screening participation.	*Journal of Women's Health*	CDC Screen for Life: National Colorectal Cancer Action Campaign focus group research to determine reason for nonparticipation in CRC screening.	Level VI	Descriptive study	CDC conducted 16 focus groups in four United States cities—four groups each in New York City (n = 36), Chicago (n = 34), Los Angeles (n = 35), and Miami (n = 34) (N = 139). Each focus group included 7–9 participants and lasted ~2 hours.	The most common reason for screening nonparticipation was aversion to some aspect of colonoscopy, such as preparation, the invasive nature of the test, or the possibility of complications.

Davis, T., Morris, J., Rademaker, A., Ferguson, L., & Arnold, C. 2017	Barriers and facilitators to colorectal cancer screening among rural women in community clinics by health literacy.	*Journal of Women's Health, Issues, & Care*	To identify rural female patients' knowledge, beliefs, barriers, self-efficacy, prior recommendation and completion of CRC screening using an FOBT and to compare these factors by health literacy level.	Level VI	Descriptive study	339 women in 4 rural community clinics in South Lousiana.	Rural women are receptive to CRC screening and view FOBTs as effective.
Dougherty, M., Brenner, A., Crockett, S., Gupta, S., Wheeler, S., Coker-Schwimmer, M., Cubillos, L., Malo, T., & Reuland, D. 2018	Evaluation of interventions intended to increase colorectal cancer screening rates in the United States: A systematic review and meta-analysis.	*JAMA Internal Medicine*	To determine which interventions increase completion of CRC tests in the United States.	Level I	Systematic Review and Meta-Analysis	73 randomized clinical trials	Patient navigation and fecal test outreach had the strongest evidence supporting a significant increase in completion of initial screening; combining interventions (e.g., navigation with test outreach) was associated with further increases in screening.
Duffy, S., Myles, J., Maroni, R., & Mohammad, A. 2017	Rapid review of evaluation of interventions to improve participation in cancer screening services.	*Journal of Medical Screening*	To review the current evidence on effects of interventions to improve cancer screening participation, focusing on effects in underserved populations.	Level I	Systematic Review	68 papers reporting 71 intervention studies	Pre-screening reminders, general practitioner endorsement, more personalized reminders for non-participants, and more acceptable screening tests were found to improve participation in cancer screening more consistently.
Feldman, J.,	Measuring and	*BMJ Quality*	To develop a	Level II	Quality	Clinic providing	Personalized

Davie, S., & Kiran, T. 2017	improving cervical, breast, and colorectal cancer screening rates in a multi-site urban practice in Toronto, Canada.	*Improvement Reports*	method for systematically identifying patients eligible for screening and whether they were overdue and to increase screening rates for cervical, breast, and colorectal cancer.		Improvement	care to over 35000 patients	reminder letter to overdue patients, provided physicians with practice-level audit and feedback, improved EMR function updated charts with accurate FOBT data).
Gilligan, A., Alberts, D., Roe, D., & Skrepnek, G. 2018	Death or debt? National estimates of financial toxicity in persons with newly-diagnosed cancer.	*American Journal of Medicine*	To evaluate the impact of cancer upon a patient's net worth and debt in the US.	Level IV	Longitudinal study	9.5 million persons with cancer	Found a substantial portion of initially-estimated 9.5 million newly-diagnosed persons with cancer who were ≥50 years of age incurred financial toxicity.
Guiriguet, C., Muñoz, L., Burón, A., Rivero, I., Grau, J., Vela-Vallespín, C., Vilarrubín, M., Torres, M., Hernández, C., Mendez, Boo, L., Torán, P., Caballeria, L., Maciá, F., & Castells, A. 2016	Alerts in electronic medical records to promote a colorectal cancer screening programme: A cluster randomised controlled trial in primary care	*British Journal of General Practice*	To evaluate effective of an alert in primary care electronic medical records; to increase patient participation in colorectal cancer screening when compared with usual care.	Level I	Cluster randomized controlled trial	130 PCPs; 41,042 patients in 10 primary care centers	EMR alert was not associated with a statistically significant increased participation in the first round of a FIT-based CRC screening program; however, 11% increase in participation when analysis restricted to those patients at follow up period.
Gutierrez, L., Bracamontes, C., Molokwu, J., Villanos, M., & Mendez, M.	Electronic medical record prompting to improve HPV vaccination rates	*Journal of Pediatric Adolescent Gynecology*	To assess the effectiveness of an electronic medical record (EMR) prompt on HPV	Level IV	Descriptive Study	12 months of clinic visits/ 2800 charts reviewed	Vaccination rates statistically improved in all clinics; but pediatric and family medicine clinics

2017			vaccination rates in the clinic setting				significantly improved after implementing the EMR pop-up prompt
Gwede, C., Koskan, A., Quinn, G., Davis, S., Ealey, J., Abdulla, R., Vadaparampil, S., Elliott, G., Lopez, D., Shibata, D., Roetzheim, R., & Meade, C. 2015	Patients' perceptions of colorectal cancer screening tests and preparatory education in Federally Qualified Health Centers	*Journal of Cancer Education*	To explore FQHC patients' perceptions about colorectal cancer screening tests and preferences for receiving in-clinic education about CRCS	Level VII	Qualitative Research	Eight mixed gender focus groups (53 patients)	Most participants with lack of knowledge about CRC risk factors; negative perceptions about colonoscopy/FOBT (dislike of test preparation, affordability, lack of health insurance, embarrassment r/t test procedures)
Health Resources and Services Administration 2017	2017 health center data	*Not applicable*	Annual report data of FQHCs nationwide	Level VII	None	None	Financial and clinical details of FQHCs nationwide
Joseph, D., Redwood, D., DeGroff, A., & Butler, E. 2016	Use of evidence-based interventions to address disparities in colorectal cancer screening	*Morbidity and Mortality Weekly Report: Supplement*	Discussion of CDC's Colorectal Cancer Control in Alaska Native Tribal Health Consortium and Washington State's Breast, Cervical, and Colon Health Program	Level II	Cohort	Alaska: five rural/remote regional THOs serving approximately 40,224 Alaska Native persons Washington:seven clinics, approximately 65,582 patients	Alaska: use of client and provider reminders and patient navigators = increases in the proportion of Alaska Native adults aged 50–80 years who were up-to-date with CRC screening from 50.9% in 2009 to 58.4% in 2012. Washington: use of dedicated staff to implement clinic systems to support

							CRC screening and the use of client reminders= increase in adults aged 50–75 years who were up-to-date with CRC screening from 24% in 2011 to 48% in 2014 in the participating clinics
Kim, J., Wang, H., Young, L., Michaud, T., Siahpush, M., Farazi, P., & Chen, L. 2018	An examination of multilevel factors influencing colorectal cancer screening in primary care accountable care organization settings: A mixed-method study	*Journal of Public Health Management and Practice*	To identify patient, provider, and delivery system–level factors associated with colorectal cancer (CRC) screening and validate findings across multiple data sets	Level II	Concurrent mixed-methods design	Eight primary care accountable care organization clinics in Nebraska	Patient level: being 65 years of age and older (odds ratio [OR] = 1.34, P < .001), being non-Hispanic white (OR = 1.93, P < .001), having insurance (OR = 1.90, P = .01), having an annual physical examination (OR = 2.36, P < .001), and having chronic conditions (OR = 1.65 for 1-2 conditions, P < .001) were associated positively with screening
Kotter, J. 1996.	Leading change	*Not applicable*	Kotter's methodology 8-Step Process for Leading Change	Level VII	None	None	Details the 8-Step Process for organizational change
Laiyemo, A., Adebogun, A., Doubeni, C., Ricks-Santi, L., McDonald-Pinkett, S., Young, P.,	Influence of provider discussion and specific recommendation on colorectal cancer screening	*Preventive Medicine*	To evaluate provider-patient communications about CRC screening with and without a specific screening modality	Level III	Descriptive	Used 2007 Health Information National Trends Survey (HINTS); identified4283 respondents at least 50 years of age and	Compliance w/ CRC screening guidelines improved when providers discuss options and make specific screening test recommendations

Cash, B., & Klabunde, C. 2014	uptake among U.S. adults		recommendation on patient compliance with screening guidelines			answered questions about their communication with their care providers and CRC screening uptake	
LaMorte, W. 2018	The heath belief model	*Not applicable*	Health Belief Model	Level VII	None	None	Discussion of the Health Belief Model
Mader, E., Fox, C., Epling, J., Noronha, G., Swanger, C., Wisniewski, A., Vitale, K., Norton, A., & Morley, C. 2016	A practice facilitation and academic detailing intervention can improve cancer screening rates in primary care safety net clinics	*Journal of the American Board of Family Medicine*	1-hour academic detailing session re: CRC guidelines and best practices, then 6 months of practice facilitation to implement evidence-based interventions to increase CRC screening	Level VI	Qualitative	4 federally qualified health centers, 10 practices affiliated with larger health systems, 4 physician-owned practices, 4 university hospital clinics, and 1 nonprofit clinic	Average screening rates for breast cancer increased by 13% (P = .001), and rates for colorectal cancer increased by 5.6% (P = .001)
May, F., Almario, C., Ponce, N., & Spiegel, B. 2015	Racial minorities are more likely than whites to report lack of provider recommendation for colon cancer screening	*American Journal of Gastroenterology*	To evaluate the association between patient race and lack of provider recommendation for CRC screening as the primary reason for screening nonadherence	Level VI	Cross-sectional observational study	5,793 unscreened subjects from the 2009 California Health Interview Survey	19.1% reported that lack of a provider recommendation was the main reason for CRC non-screening
Nagelhout, E., Comarell, K., Samadder, N., & Wu, Y. 2017	Barriers to colorectal cancer screening in a racially diverse population served by a safety-net clinic.	*Journal of Community Health*	To identify differences in CRC screening barriers/ evaluate association between provider recommendation and CRC screening adherence	Level VI	Cross sectional survey design	N = 197; 48% Hispanic, 25% White, 10% Pacific Islander, 4% Black and 13% other races/ethnicity	Barriers included fear of test results, inability to leave work for appt., unawareness of need for screening, and lack of provider recommendation for CRC screening
National Cancer	Theory at a glance:	*Not applicable*	Summary of health	Level VI	None	None	Health Belief Model

Institute. 2005	A guide for health promotion practice. (2nd ed.).		theories				for health promotion activities
National Cancer Institute. 2018	Financial burden of cancer care	*Not applicable*	National economic burden of cancer care	Level VII	None	None	Care for cancer survivors estimated at $137.4 billion in medical care expenditures in the United States in 2010
National Center for Health Statistics. 2016	Health, United States, 2015: With special feature on racial and ethnic disparities. Hyattsville: MD.	*Not applicable*	39th report on the health status of the nation	Level VII	None	None	One-third of eligible adults in the U.S. have never been CRC screened; the two groups with lowest screening rates are the uninsured and immigrants with fewer than 10 years residence in the U.S.
North Carolina State Center for Health Statistics 2017	Colon and rectum cancer	*Not applicable*	NC health statistics	Level VII	None	None	Cancer of the colon and rectum was the fourth most frequently occurring and the second leading cause of cancer death in North Carolina from 2010 to 2014; between 2010 and 2014, 37.7 per 100,000 persons/year
Office of Disease Prevention and Health Promotion 2018	Healthy people 2020	*Not applicable*	Healthy People 2020 cancer objectives	Level VII	None	None	Reduce the colorectal cancer death rate

Onders, R., Spillane, J., Reilley, B., & Leston, J. 2014	Use of electronic clinical reminders to increase preventive screenings in a primary care setting: Blueprint from a successful process in Kodiak, Alaska	*Journal of Primary Care & Community Health*	To detail effectiveness of national clinical reminders from the Indian Health Service for 5 key preventive screenings (tobacco use, alcohol use, depression, intimate partner violence, comprehensive cardiovascular exam)	Level IV	Descriptive	All Kodiak Area Native Association (KANA) primary health clinics in Kodiak, Alaska and 6 outlying villages	Data from 2007-2011 show screening rates for all 5 measures improved considerably with use of EMR clinical reminders
Peterson, E., Ostroff, J., DuHamel, K., D'Agostino, T., Hernandez, M., Canzona, M., & Bylund, C. 2016	Impact of provider-patient communication on cancer screening adherence: A systematic review	*Preventive Medicine*	To analyze studies that focused on the role of provider-patient communication in screening behavior for cervical, breast, and colorectal cancer	Level I	Systematic Review	35 articles included in the review	Overwhelming evidence that provider recommendation significantly improves screening rates
Roland, K., Milliken, E., Rohan, E., DeGroff, A., White, S., Melillo, S., Rorie, W., Signes, C, & Young, P. 2017	Use of community health workers and patient navigators to improve cancer outcomes among patients served by Federally Qualified Health Centers: A systematic literature review	*Health Equity*	To identify studies of cancer-related CHW/PN interventions in FQHCs/ to describe the components and characteristics of those interventions in order to guide future intervention development and evaluation	Level I	Systematic review	24 articles, all reporting positive outcomes of CHW/PNs interventions in FQHCs	Use of community health workers and patient navigator improve FQHC cancer outcomes
Rosenstock, I., Strecher, V., & Becker, M. 1988	Social learning theory and the Health Belief Model	*Health Education & Behavior*	Discussion of Health Belief Model and social learning theory	Level VII	None	None	Self-efficacy incorporated into Health Belief Model

Savas, L., Vernon, S., Atkinson, J., & Fernández, M. 2015	Effect of acculturation and access to care on colorectal cancer screening in low-income Latinos	*Journal of Immigrant and Minority Health*	To examine relationships between acculturation/access to/utilization of services/and CRC screening in low income Latinos	Level VI	Cross sectional study	Structured interviews with 544 Latino men and women (>50 years) residing in the Texas-Mexico border area	Findings: CRCS intervention research in Latinos should focus on increasing physicians' screening recommendations, promoting regular check-ups, and increasing CRC prevention efforts on less acculturated and uninsured groups
Senore, C., Inadomi, J., Segnan, N., Bellisario, C., & Hassan, C. 2015	Optimising colorectal cancer screening acceptance: A review	*Gut*	To review available evidence concerning effective interventions to increase CRC screening acceptance	Level I	Systematic review and meta-analysis	65 studies	Most effective interventions are multifactorial and target multiple levels of care/consider factors outside the individual clinician control
Siembida, E., Radhakrishnan, A., Nowak, S., Parker, A., & Pollack, C. 2017	Linking reminders and physician breast cancer screening recommendations: Results from a national survey	*JCO Clinical Cancer Informatics*	To examine the extent reminders used for breast cancer screening targeting younger and older patients	Cross-sectional study	Level VI	871 physicians	Reminders significantly associated with increases in physician screening recommendations for mammography
U.S. Preventive Services Task Force. 2017	2017 Final recommendation statement: Colorectal cancer: screening.	*Not applicable*	Guidelines for colorectal cancer screening	Level VII	None	None	Adults 50-75
Zadlo, J. 2018	Cost-effectiveness of new and emerging treatment options for the treatment of metastatic colorectal cancer	*American Journal of Managed Care*	To evaluate the economic costs associated with CRC and its management	Level I	Systematic review	3 studies	Economic burden associated with stage of disease at diagnosis, patient age, time period studied, oncologic therapy choice, and

							point of view
Zimet, G., Dixon, B., Xiao, S., Tu, W., Kulkarni, A., Dugan, T., Sheley, M., & Downs, S. 2017	Simple and elaborated clinical reminder prompts for human papillomavirus vaccination: A randomized clinical trial	*Academic Pediatrics*	To evaluate the effects of simple and elaborated health care provider (HCP) reminder prompts on human papillomavirus (HPV) vaccine initiation rates	Level II	Randomized controlled trial	Twenty-nine pediatric health care providers serving 5 pediatric clinics	An elaborated HCP-targeted reminder prompt (with suggested recommendation language) might improve rates of HPV vaccine initiation

Appendix B

CDC Factsheets (English/Spanish)

COLORECTAL CANCER SCREENING

What Is Colorectal Cancer?

Colorectal cancer is cancer that occurs in the colon or rectum. Sometimes it is called colon cancer. The colon is the large intestine or large bowel. The rectum is the passageway that connects the colon to the anus.

Screening Saves Lives

Colorectal cancer is the second leading cancer killer in the United States, but it doesn't have to be. If you are 50 or older, getting a colorectal cancer screening test could save your life. Here's how:

- Colorectal cancer usually starts from precancerous polyps in the colon or rectum. A polyp is a growth that shouldn't be there.
- Over time, some polyps can turn into cancer.
- Screening tests can find precancerous polyps, so they can be removed before they turn into cancer.
- Screening tests also can find colorectal cancer early, when treatment works best.

Who Gets Colorectal Cancer?

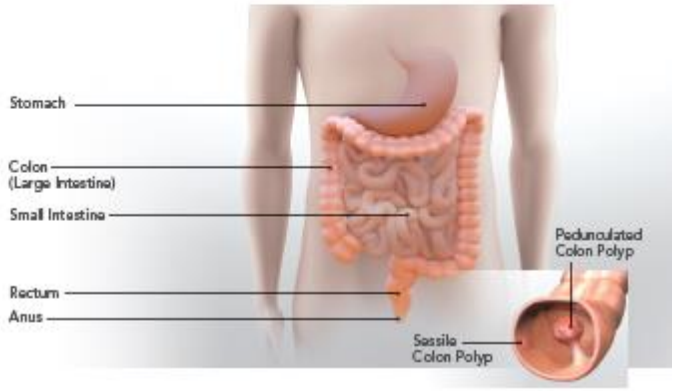
- Both men and women can get it.
- It is most often found in people 50 or older.
- The risk increases with age.

Are You at Increased Risk?

Your risk for colorectal cancer may be higher than average if:

- You or a close relative have had colorectal polyps or colorectal cancer.
- You have inflammatory bowel disease, Crohn's disease, or ulcerative colitis.
- You have a genetic syndrome such as familial adenomatous polyposis (FAP) or hereditary nonpolyposis colorectal cancer.

People at increased risk for colorectal cancer may need earlier or more frequent tests than other people. Talk to your doctor about when to begin screening, which test is right for you, and how often you should be tested.



Colorectal Cancer Can Start With No Symptoms

Precancerous polyps and early-stage colorectal cancer don't always cause symptoms, especially at first. This means that someone could have polyps or colorectal cancer and not know it. That is why having a screening test is so important.

What Are the Symptoms?

Some people with colorectal polyps or colorectal cancer do have symptoms. They may include:

- Blood in or on your stool (bowel movement).
- Stomach pain, aches, or cramps that don't go away.
- Losing weight and you don't know why.

If you have any of these symptoms, talk to your doctor. They may be caused by something other than cancer. However, the only way to know is to see your doctor.

Types of Screening Tests

The U.S. Preventive Services Task Force recommends that adults aged 50–75 be screened for colorectal cancer. The decision to be screened after age 75 should be made on an individual basis. If you are aged 76-85, ask your doctor if you should be screened.

Several different screening tests can be used to find polyps or colorectal cancer. They include:

Stool Tests

Guaiac-based Fecal Occult Blood Test (gFOBT): uses the chemical guaiac to detect blood in stool. At home you use a stick or brush to obtain a small amount of stool. You return the test to the doctor or a lab, where stool samples are checked for blood.

Fecal Immunochemical Test (FIT): uses antibodies to detect blood in the stool. You receive a test kit from your health care provider. This test is done the same way as gFOBT.

FIT-DNA Test (or Stool DNA test): combines the FIT with a test to detect altered DNA in stool. You collect an entire bowel movement and send it to a lab to be checked for cancer cells.

How Often: gFOBT Once a year. FIT Once a year. FIT-DNA once every one or three years.

Flexible Sigmoidoscopy

For this test, the doctor puts a short, thin, flexible, lighted tube into your rectum. The doctor checks for polyps or cancer inside the rectum and lower third of the colon.

How Often: Every five years, or every 10 years with a FIT every year.

Colonoscopy

Similar to flexible sigmoidoscopy, except the doctor uses a longer, thin, flexible, lighted tube to check for polyps or cancer inside the rectum and the entire colon. During the test, the doctor can find and remove most polyps and some cancers. Colonoscopy also is used as a follow-up test if anything unusual is found during one of the other screening tests.

How Often: Every 10 years.

CT Colonography (Virtual Colonoscopy)

Computed tomography (CT) colonography, also called a virtual colonoscopy, uses X-rays and computers to produce images of the entire colon. The images are displayed on a computer screen for the doctor to analyze.

How Often: Every five years.

Which Test is Right for You?

There is no single "best test" for any person. Each test has advantages and disadvantages. Talk to your doctor about which test or tests are right for you and how often you should be screened.

Free or Low-Cost Screening

Colorectal cancer screening tests may be covered by your health insurance policy without a deductible or co-pay. Where feasible, CDC's Colorectal Cancer Control Program grantees provides free or low-cost screenings to eligible men and women. To find out more visit www.cdc.gov/cancer/crccp/contact.htm.

The Bottom Line

If you're 50 or older, talk with your doctor about getting screened. For more information, visit **www.cdc.gov/screenforlife** or call 1-800-CDC-INFO (1-800-232-4636). For TTY, call 1-888-232-6348.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Screen for Life
National Colorectal Cancer Action Campaign

www.cdc.gov/screenforlife
1-800-CDC-INFO

CDC Publication #P-4181, Revised April 2017

PRUEBAS DE DETECCIÓN DE CÁNCER COLORRECTAL

¿Qué es el cáncer colorrectal?

El cáncer colorrectal es un cáncer que aparece en el colon o en el recto. Algunas veces se le llama cáncer de colon. El colon es el intestino grueso. El recto es el conducto que conecta el colon con el ano.

Las pruebas de detección salvan vidas

El cáncer colorrectal es la segunda causa de muerte por cáncer en los Estados Unidos, pero no debería ser así. Si usted tiene 50 años o más, hacerse una prueba de detección para el cáncer colorrectal podría salvar su vida. Aquí le decimos cómo:

- El cáncer colorrectal generalmente empieza con pólipos precancerosos en el colon o en el recto. Un pólipo es un crecimiento excesivo del tejido que no debería estar ahí.
- Con el paso del tiempo algunos pólipos pueden convertirse en cáncer.
- Las pruebas de detección pueden encontrar pólipos precancerosos que pueden ser extirpados antes de que se conviertan en cáncer.
- Las pruebas de detección también pueden descubrir el cáncer colorrectal en sus primeras etapas, cuando el tratamiento es más eficaz.

¿Quién puede tener cáncer colorrectal?

- Los hombres y las mujeres pueden tener cáncer colorrectal.
- El cáncer colorrectal es más común en las personas de 50 años o más.
- El riesgo de tener cáncer colorrectal aumenta con la edad.

¿Tiene usted un alto riesgo?

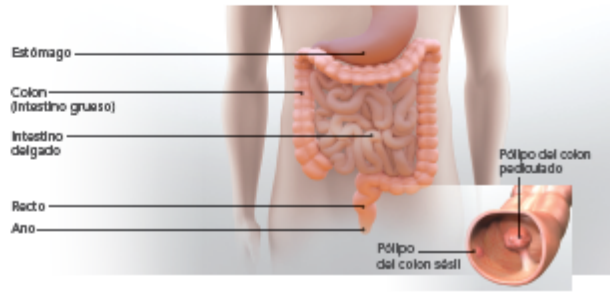
El riesgo de que usted tenga cáncer colorrectal puede ser mayor de lo normal si:

- Usted o un familiar cercano ha tenido pólipos colorrectales o cáncer colorrectal.
- Usted tiene una enfermedad inflamatoria intestinal, enfermedad de Crohn o colitis ulcerosa.
- Usted tiene un síndrome genético, por ejemplo poliposis adenomatosa familiar (PAF) o cáncer colorrectal hereditario no polipósico.

Las personas con alto riesgo de cáncer colorrectal pueden necesitar pruebas de detección más temprano en su vida y con mayor frecuencia que otras personas. Pregúntele a su médico cuándo comenzar a hacerse las pruebas de detección y con qué frecuencia.

El cáncer colorrectal puede empezar sin síntomas

Los pólipos precancerosos y el cáncer colorrectal de etapa temprana no siempre presentan síntomas, especialmente al principio. Esto significa que una persona puede tener pólipos o cáncer colorrectal y no saberlo. Por eso es muy importante hacerse las pruebas de detección.



¿Cuáles son los síntomas?

Algunas personas que tienen pólipos o cáncer colorrectal sí presentan síntomas. Los síntomas incluyen:

- Sangre en la materia fecal.
- Dolor de estómago, molestias o cólicos persistentes.
- Pérdida de peso sin razón conocida.

Si usted tiene cualquiera de estos síntomas hable con su médico. Estos síntomas podrían ser ocasionados por alguna otra causa. Sin embargo, la única manera de saberlo es consultando a su médico.

Tipos de pruebas de detección

El Grupo de Trabajo sobre Servicios Preventivos de los Estados Unidos (U.S. Preventive Services Task Force o USPSTF) recomienda que los adultos entre los 50 y los 75 años de edad se realicen una prueba de detección de cáncer colorrectal. La decisión de realizarse las pruebas de detección después de los 75 años deberá ser tomada según las necesidades de cada persona. Si usted tiene entre 76 y 85 años, pregúntele a su médico si debe hacerse una prueba de detección.

Hay diferentes pruebas para detectar los pólipos o cáncer colorrectal. Estas incluyen:

Análisis de heces

La prueba gFOBT de alta sensibilidad (análisis de sangre oculta en materia fecal): utiliza la sustancia química guayacol (guaiac) para detectar sangre en la materia fecal. En su casa, usted utiliza un palillo o pincel para obtener pequeñas muestras de materia fecal. Luego, lleva las muestras al médico o al laboratorio donde son examinadas para detectar sangre.

Prueba Inmunoquímica Fecal (FIT por sus siglas en inglés): utiliza anticuerpos para detectar sangre en la materia fecal. Para realizar esta prueba su proveedor de atención de la salud le dará lo necesario para tomar la muestra. La prueba se realiza de la misma manera que la prueba gFOBT de alta sensibilidad.

Prueba FIT-ADN (o Análisis de ADN en heces): combina la prueba FIT con una prueba para detectar ADN alterado en las heces. Usted recoge una muestra completa de evacuación intestinal (materia fecal) y la envía al laboratorio para determinar la presencia de células cancerosas.

Frecuencia: gFOBT una vez al año. FIT-ADN una vez al año o cada tres años.

Sigmoidoscopia flexible

En esta prueba, el médico introduce por el recto un tubo corto, delgado, flexible y con una luz. El médico busca pólipos o cáncer en el recto y en el tercio inferior del colon.

Frecuencia: Cada cinco años, o cada 10 años si se hace una FIT una vez al año.

Colonoscopia

Esta prueba es parecida a la sigmoidoscopia flexible. La diferencia consiste en que el médico utiliza un tubo más largo, delgado, flexible y con una luz para buscar pólipos o cáncer en el recto y en todo el colon. Durante la prueba, el médico puede encontrar y remover la mayoría de los pólipos y algunos cánceres. La colonoscopia también se utiliza como prueba adicional cuando se ha encontrado algo extraño en alguna otra prueba de detección.

Frecuencia: Cada 10 años.

Colonografía TC (colonoscopia virtual)

La Colonografía por Tomografía Computarizada (TC), llamada también colonoscopia virtual, utiliza radiografías y computadoras para producir imágenes de todo el colon. El médico analiza las imágenes que aparecen en la pantalla de una computadora.

Frecuencia: Cada cinco años.

¿Cuál de las pruebas es la más adecuada para usted?

No hay una prueba "ideal" para cada persona. Todas las pruebas tiene ventajas y desventajas. Pregúntele a su médico cuál es la prueba o la combinación de pruebas más apropiada para usted y con qué frecuencia debería hacérsela.

Pruebas de detección gratuitas o de bajo costo

Su plan de seguro médico podría cubrir las pruebas de detección para el cáncer colorrectal sin deducibles o copagos. Cuando es posible, algunos de los beneficiarios de los subsidios del Programa de Control del Cáncer Colorrectal de los CDC ofrecen pruebas de detección gratuitas o de bajo costo a hombres y mujeres que reúnen los requisitos necesarios. Para obtener más información visite www.cdc.gov/spanish/cancer/dcpc/about/crccp.htm.

Lo fundamental

Si usted tiene 50 años o más, hable con su médico sobre las pruebas de detección. Para obtener más información, visite www.cdc.gov/spanish/cancer/colorectal/sfl o llame al 1-800-CDC-INFO (1-800-232-4636—oprima 2 para español). Los usuarios de teletipos (TTY) pueden llamar al 1-888-232-6348.

www.cdc.gov/screenforlife
1-800-CDC-INFO

Publicación de los CDC No. 17-4781, revisada en febrero de 2017

Appendix C

CDC: The Dos and Don’ts of Colorectal Cancer Screening

The Dos and Don’ts of Colorectal Cancer Screening

Do’s

- ✔ **Do** make a recommendation! Be clear that screening is important. Ask patients about their needs and preferences. The best test is the one that gets done.
- ✔ **Do** use the American Cancer Society and/or the USPSTF recommendations for colorectal cancer screening in average-risk adults, starting at age 50.*
- ✔ **Do** assess your patient’s family history, medical history, and age.
- ✔ **Do** be persistent with reminders.
- ✔ **Do** develop standard office operating procedures and policies for colorectal cancer screening, including the use of EHR prompts and patient navigation.

Don’ts

- ✘ **Do not** use digital rectal exams (DREs) for colorectal cancer screening. In 1 large study, DREs missed 19 of 21 cancers.
- ✘ **Do not** repeat a positive stool test. Always refer the patient for a colonoscopy.
- ✘ **Do not** use stool tests on those with a higher risk. A colonoscopy must be performed.
- ✘ **Do not** forget to use non-clinical staff to help make sure screening gets done. They can hand out educational materials and schedule follow-up appointments.
- ✘ **Do not** forget to coordinate care across the continuum.

** If a patient at any age is symptomatic, please evaluate and refer them as needed for a colonoscopy.*

For more tools and resources, please visit nccrt.org or contact

National Colorectal Cancer Roundtable

American Cancer Society

Appendix D

Site Approval Letter

Greene County Health Care, Inc.

7 Professional Drive
Snow Hill, North Carolina 28580

Executive Office
(252) 747-8162
Fax (252) 747-8163

Snow Hill Medical Center
(252) 747-2921
Fax (252) 747-4915

Student Health Services
(252) 747-5841
Fax (252) 747-4916

Kate B. Reynolds Medical Center
(252) 747-4199
Fax (252) 747-8400

Farmworker Services
(252) 747-4078

Greene Dental Services
(252) 747-3846
Fax (252) 747-2466

Walstonburg Medical Center
(252) 753-3771
Fax (252) 753-4814

James D. Bernstein Medical Center
(252) 695-6352
Fax (252) 695-6359

James D. Bernstein Dental Services
(252) 695-6355
Fax (252) 695-6358

Pamlico Community Health Center
(252) 745-2070
Fax (252) 745-2202

Date: November 26, 2018

To Whom It May Concern:

Greene County Health Care, Inc. has reviewed Jennifer Perry's DNP Project titled *"Provider Prompting to Improve Colorectal Cancer Screening Rates"*. Ms. Perry has organizational support and approval to conduct her project within our institution(s). We understand that for Ms. Perry to achieve completion of the DNP program, dissemination of the project will be required by the University, which will include a public presentation related to the project and a manuscript submission will be encouraged.

Our organization has deemed this project as a quality improvement initiative and not requiring institutional IRB review.

Thank you,

[redacted]

Director of Quality Improvement and Safety
Greene County Health Care, Inc.
7 Professional Dr.
Snow Hill, NC 28580
252-747-8162

COMMUNITY HEALTH CENTER FQHC QUALITY

Your COMMUNITY HEALTH CENTER Your family's home for health

Appendix E

DNP Project Data Collection Spreadsheet

DNP Project Data Collection									
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Totals
How many eligible patients seen in clinic weekly?									
How many patients with current documentation of CRC screening in chart prior to clinic visit?									
How many with current documentation of CRC screening in chart documented in correct location?									
Was CRC screening offered at clinic visit?									
Was the daily patient list provided for the providers?									
How many patients with current documentation of CRC screening in chart at end of project?									

Appendix F

IRB Qualtrics Survey

Click "download PDF" to save a copy of this page for your records.
Note: The IRB Office does not maintain copies of your responses.

Below is a summary of your responses Download PDF

Quality Improvement/Program Evaluation Self-Certification Tool

Purpose:
Projects that do not meet the federal definition of human research pursuant to 45 CFR 46 do not require IRB review. This tool was developed to assist in the determination of when a project falls outside of the IRB's purview.

Instructions:
Please complete the requested project information, as this document may be used for documentation that IRB review is not required. Select the appropriate answers to each question in the order they appear below. Additional questions may appear based on your answers. If you do not receive a STOP HERE message, the form may be printed as certification that the project is "not research", and does not require IRB review. The IRB will not review your responses as part of the self-certification process.

Name of Project Leader:

Jennifer Perry

Project Title:

PROVIDER PROMPTING TO IMPROVE COLORECTAL CANCER SCREENING RATES

Brief description of Project/Goals:

The proposed intervention for the DNP project is to increase provider delivery of the available colorectal screening options by the use of provider prompts, specifically utilizing an Electronic Medical Record (EMR) reminder and a daily list of patients who do not have an up-to-date CRC screening documented in the EMR at an Eastern NC Federally Qualified Health Center. The Medical Assistant will print a daily list of patients who are not up-to-date on CRC screening for the provider's use. In addition, upon the provider opening the patient's chart, a pop-up notification will alert the provider that the patient is due or overdue for colon cancer screening. Once alerted, the GCHC providers will then offer one of the three available screening options for colorectal screening for average risk adults age 50-75, specifically either FOBT yearly, flexible sigmoidoscopy every five years, or colonoscopy every 10 years. Once the choice of screening is decided upon through mutual provider-patient discussion and discussion of individual costs, benefits, and risks and the patient has participated in screening, the GCHC provider will document the screening in the appropriate location in the EMR. Prior to the project implementation period, an educational session will be held for providers and clinical staff to provide information regarding current colorectal cancer screening recommendations/guidelines and to educate them regarding the use of the patient list and EMR prompt. The goal outcome of the proposed DNP project is to improve provider compliance with offering colorectal cancer screenings and improved colorectal cancer screening rates.

Will the project involve testing an experimental drug, device (including medical software or assays), or biologic?

☐ Yes

■ No

Has the project received funding (e.g. federal, industry) to be conducted as a human subject research study?

☐ Yes

■ No

Is this a multi-site project (e.g. there is a coordinating or lead center, more than one site participating, and/or a study-wide protocol)?

☐ Yes

■ No

Is this a systematic investigation designed with the intent to contribute to generalizable knowledge (e.g. testing a hypothesis; randomization of subjects; comparison of case vs. control; observational research; comparative effectiveness research; or comparable criteria in alternative research paradigms)?

☐ Yes

■ No

Will the results of the project be published, presented or disseminated outside of the institution or program conducting it?

■ Yes

☐ No

Would the project occur regardless of whether individuals conducting it may benefit professionally from it?

■ Yes

☐ No

Does the project involve "no more than minimal risk" procedures (meaning the probability and magnitude of harm or discomfort anticipated are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests)?

■ Yes

☐ No

Is the project intended to improve or evaluate the practice or process within a particular institution or a specific program, and falls under well-accepted care practices/guidelines?

■ Yes

☐ No

Based on your responses, the project appears to constitute QI and/or Program Evaluation and IRB review is not required because, in accordance with federal regulations, your project does not constitute research as defined under 45 CFR 46.102(d). If the project results are disseminated, they should be characterized as QI and/or Program Evaluation findings. Finally, if the project changes in any way that might affect the intent or design, please complete this self-certification again to ensure that IRB review is still not required. Click the button below to view a printable version of this form to save with your files, as it serves as documentation that IRB review is not required for this project. 3/17/2019

Appendix G

Provider Demographics Data Questionnaire

DNP Project Provider Demographics Data Collection Questionnaire

1.Please select your professional role.
MD, DO, NP, PA, Other

2. How many years of primary care practice do you have?
<1, 1, 2, 3…

3. What is your certification?
Family Medicine, OB/GYN, Med-Peds, Internal Medicine, Other

4. Are you full-time or part-time?
Full-time, Part-time

Appendix H

Post-implementation Data Collection Questions

Post-Implementation Data Collection Questions

Post-implementation Chart Review
Is documentation of up-to-date colorectal cancer screening noted in the patient's chart?
Yes, No
Did the provider indicate that colorectal cancer screening was offered to the patient during the clinical appointment?
Yes, No